

CLEAN CLAIMS

1-59. (Cancelled)

60. (Currently Amended) A fiber optic module comprising:

a first optoelectronic device to couple photons into or receive photons out of a first optical fiber;

a first printed circuit board coupled to the first optoelectronic device parallel to an optical axis of the first optoelectronic device, the first printed circuit board having one or more pins;

a shielded housing spaced around the first printed circuit board, the shielded housing to reduce electromagnetic interference (EMI); and

a base coupled to the shielded housing perpendicular to the first printed circuit board.

61. (Previously Added) The fiber optic module of claim 60 wherein,

the first optoelectronic device has a first terminal electrically coupled to one side of the first printed circuit board and a second terminal electrically coupled to an opposite side of the first printed circuit board.

1 62. (Previously Added) The fiber optic module of claim 60
2 wherein,

3 the first printed circuit board is a vertical printed
4 circuit board perpendicular to a horizontal plane and the
5 optical axis of the first optoelectronic device is parallel to
6 the horizontal plane.

1 63. (Previously Added) The fiber optic module of claim 60
2 wherein,

3 the fiber optic module mounts to a system printed circuit
4 board such that the first printed circuit board is perpendicular
5 to the system printed circuit board and the optical axis of the
6 first optoelectronic device is parallel to the system printed
7 circuit board.

1 64. (Previously Added) The fiber optic module of claim 63
2 wherein,

3 the one or more pins of the first printed circuit board
4 couple to the system printed circuit board.

1 65. (Previously Added) The fiber optic module of claim 63
2 wherein,

3 the one or more pins of the first printed circuit board

4 couple to a connector of the system printed circuit board.

1 66. (Previously Added) The fiber optic module of claim 60
2 further comprising:

3 a first lens to focus photons between the first
4 optoelectronic device and the optical fiber.

1 67. (Previously Added) The fiber optic module of claim 60
2 wherein:

3 the shielded housing is electrically coupled to ground.

1 68. (Previously Added) The fiber optic module of claim 67
2 wherein:

3 the shielded housing electrically couples to ground by
4 coupling to a system chassis.

1 69. (Previously Added) The fiber optic module of claim 67
2 wherein:

3 the shielded housing electrically couples to ground through
4 a trace on the first printed circuit board which is coupled to
5 one of the one or more pins of the first printed circuit board.

1 70. (Currently Amended) The fiber optic module of claim 60

2 wherein,

3 the shielded housing includes the base as a portion
4 thereof, the base having one or more openings from which the one
5 or more pins of the first printed board extend.

1 71. (Currently Amended) The fiber optic module of claim 60
2 wherein,

3 the base has one or more openings from which the one or
4 more pins of the first printed board extend.

1 72. (Previously Added) The fiber optic module of claim 60
2 further comprising:

3 a nose to receive an optical fiber connector and hold an
4 optical fiber substantially fixed and aligned with the optical
5 axis of the first optoelectronic device.

1 73. (Previously Added) The fiber optic module of claim 72
2 wherein,

3 the nose provides shielding to reduce electromagnetic
4 interference (EMI).

1 74. (Currently Amended) The fiber optic module of claim 60
2 further comprising:

3 a second optoelectronic device to receive photons out of or

4 couple photons into a second optical fiber;

5 a second printed circuit board parallel to the first
6 printed circuit board, the second printed circuit board coupled
7 to the second optoelectronic device parallel to an optical axis
8 of the second optoelectronic device, the second printed circuit
9 board having a second plurality of pins; and wherein,

10 the shielded housing is spaced around the first and second
11 printed circuit boards to reduce electromagnetic interference
12 (EMI).

1 75. (Previously Added) The fiber optic module of claim 74
2 wherein,

3 the second optoelectronic device has a first terminal
4 coupled to one side of the second printed circuit board and a
5 second terminal coupled to an opposite side of the second
6 printed circuit board.

1 76. (Currently Amended) The fiber optic module of claim 74
2 wherein,

3 the shielded housing includes the base as a portion
4 thereof, the base having openings from which the one or more
5 pins of the first printed board extend and the one or more pins
6 of second printed circuit board extend.

1 77. (Currently Amended) The fiber optic module of claim 74
2 wherein,

3 the base has openings from which the one or more pins of
4 the first printed board extend and the one or more pins of
5 second printed circuit board extend.

1 78. (Previously Added) The fiber optic module of claim 74
2 further comprising:

3 a nose to receive a first optical fiber connector and hold
4 a first optical fiber substantially fixed and aligned with the
5 optical axis of the first optoelectronic device and to receive a
6 second optical fiber connector and hold a second optical fiber
7 substantially fixed and aligned with the optical axis of the
8 second optoelectronic device.

1 79. (Previously Added) The fiber optic module of claim 78
2 wherein,

3 the nose provides shielding to reduce electromagnetic
4 interference (EMI).

1 80. (Previously Added) The fiber optic module of claim 74
2 wherein,

3 the first printed circuit board and the second printed

4 circuit board are vertical printed circuit boards perpendicular
5 to a horizontal plane.

1 81. (Previously Added) The fiber optic module of claim 74
2 wherein,

3 the first printed circuit board and the second printed
4 circuit board are vertical printed circuit boards perpendicular
5 to a system printed circuit board when the fiber optic module is
6 mounted thereto.

1 82. (Currently Amended) The fiber optic module of claim 74
2 further comprising:

3 an internal shield between the first printed circuit board
4 and the second printed circuit board and parallel therewith

5 and wherein, the shielded housing is spaced around the
6 first printed circuit board and the second printed circuit board
7 to reduce electromagnetic interference (EMI).

1 83. (Currently Amended) A fiber optic module for coupling
2 photons between optoelectronic devices and optical fibers, the
3 fiber optic module comprising:

4 a base to mount the fiber optic transceiver in a system to
5 couple photons between optoelectronic devices and optical
6 fibers;

7 a first printed circuit board perpendicular to the base,
8 the first printed circuit board having a pin inserted through a
9 first opening in the base;

10 a first optoelectronic device having terminals coupled to
11 the first printed circuit board, the first optoelectronic device
12 having an optical axis parallel to the first printed circuit
13 board;

14 a second printed circuit board perpendicular to the base
15 and parallel to the first printed circuit board, the second
16 printed circuit board having a pin inserted through a second
17 opening in the base;

18 a second optoelectronic device having terminals coupled to
19 the second printed circuit board, the second optoelectronic
20 device having an optical axis parallel to the second printed
21 circuit board; and

22 a shielded housing coupled to the base, the shielded
23 housing spaced apart and wrapped around the first printed
24 circuit board and the second printed circuit board to reduce
25 electromagnetic interference (EMI).

1 84. (Currently Amended) The fiber optic module of claim 83
2 further comprising:

3 an internal shield between the first printed circuit board
4 and the second printed circuit board and parallel therewith

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5 and wherein, the shielded housing is spaced apart and
6 wrapped around the first printed circuit board and the second
7 printed circuit board to reduce electromagnetic interference
8 (EMI).

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1 85. (Currently Amended) The fiber optic module of claim 84
2 wherein,

3 the internal shield provides shielding to reduce crosstalk
4 between the first printed circuit board and the second printed
5 circuit board.

1 86. (Previously Added) The fiber optic module of claim 83
2 further comprising:

3 a first lens to focus photons between the first
4 optoelectronic device and a first optical fiber; and

5 a second lens to focus photons between the second
6 optoelectronic device and a second optical fiber.

1 87. (Previously Added) The fiber optic module of claim 83
2 wherein,

3 the first printed circuit board and the second printed
4 circuit board are vertical printed circuit boards perpendicular
5 to a horizontal plane.

1 88. (Previously Added) The fiber optic module of claim 83
2 wherein,

3 the first printed circuit board and the second printed
4 circuit board are vertical printed circuit boards perpendicular
5 to a horizontal system printed circuit board when the fiber
6 optic module is mounted thereto.

1 89. (Previously Added) The fiber optic module of claim 83
2 further comprising:

3 a nose coupled to the base, the nose to receive an optical
4 fiber connector to align a pair of optical fibers with the
5 optical axis of the first optoelectronic device and the optical
6 axis of the second optoelectronic device.

1 90. (Previously Added) The fiber optic module of claim 89,
2 wherein,

3 the nose includes shielding to reduce electromagnetic
4 interference.

1 91. (Previously Added) The fiber optic module of claim 83,
2 wherein,

3 the fiber optic module is a fiber optic transceiver and
4 wherein

5 the first optoelectronic device is a photodetector,
6 and
7 the second optoelectronic device is an emitter.

1 92. (Currently Amended) The fiber optic module of claim 91,
2 wherein,
3 the emitter is a vertical cavity surface emitting laser
4 (VCSEL) .

1 93. (Previously Added) The fiber optic module of claim 83
2 wherein,
3 the first optoelectronic device has a first terminal
4 electrically coupled to one side of the first printed circuit
5 board and a second terminal electrically coupled to an opposite
6 side of the first printed circuit board, and
7 the second optoelectronic device has a first terminal
8 electrically coupled to one side of the second printed circuit
9 board and a second terminal electrically coupled to an opposite
10 side of the second printed circuit board.

1 94. (Currently Amended) A method of assembling a fiber
2 optic module, the method comprising:
3 providing a first printed circuit board and coupling
4 terminals of a first optoelectronic device to the first printed

5 circuit board such that an optical axis of the first
6 optoelectronic device is parallel with the first printed circuit
7 board;

8 providing a second printed circuit board and coupling
9 terminals of a second optoelectronic device to the second
10 printed circuit board such that an optical axis of the second
11 optoelectronic device is parallel with the second printed
12 circuit board; and

13 providing a shielded housing spaced around the first
14 printed circuit board and the second printed circuit board such
15 that the first printed circuit board is parallel with the second
16 printed circuit board and the optical axis of the first
17 optoelectronic device is parallel with the optical axis of the
18 second optoelectronic device.

1 95. (Previously Added) The method of claim 94 further
2 comprising:

3 coupling a base to the shielded housing perpendicular to
4 the first printed circuit board and the second printed circuit
5 board.

1 96. (Currently Amended) The method of claim 94 further
2 comprising:

3 prior to providing the shielded housing spaced around the

4 first printed circuit board and the second printed circuit
5 board,

6 inserting an internal shield between the first printed
7 circuit board and the second printed circuit board.

1 97. (Previously Added) The method of claim 94 wherein,
2 the first printed circuit board and the second printed
3 circuit board are vertical printed circuit boards perpendicular
4 to a horizontal plane.

1 98. (Previously Added) The method of claim 94 wherein,
2 the first printed circuit board and the second printed
3 circuit board are vertical printed circuit boards perpendicular
4 to a horizontal system printed circuit board when the fiber
5 optic module is mounted thereto.

1 99. (Previously Added) The method of claim 94 wherein,
2 the first optoelectronic device has a first terminal
3 electrically coupled to one side of the first printed circuit
4 board and a second terminal electrically coupled to an opposite
5 side of the first printed circuit board, and
6 the second optoelectronic device has a first terminal
7 electrically coupled to one side of the second printed circuit
8 board and a second terminal electrically coupled to an opposite

9 side of the second printed circuit board.

1 100. (New) The fiber optic module of claim 60 wherein,
2 the shielded housing is a metal housing.

1 101. (New) The fiber optic module of claim 60 wherein,
2 the shielded housing is a metal plated plastic housing.

1 102. (New) The fiber optic module of claim 74 wherein,
2 the first optoelectronic device is a photodetector to
3 receive photons out of the first optical fiber,
4 the second optoelectronic device is an emitter to couple
5 photons into the second optical fiber, and
6 the fiber optic module is a fiber optic transceiver module.

1 103. (New) The fiber optic module of claim 83 wherein,
2 the shielded housing is a metal housing.

1 104. (New) The fiber optic module of claim 83 wherein,
2 the shielded housing is a metal plated plastic housing.

1 105. (New) A fiber optic module comprising:
2 a first optoelectronic device to couple photons into or

3 receive photons out of a first optical fiber;

4 a first printed circuit board coupled to the first
5 optoelectronic device parallel to an optical axis of the first
6 optoelectronic device, the first printed circuit board having
7 one or more pins; and

8 a metallic shielded housing spaced apart around the first
9 printed circuit board, the metallic shielded housing to reduce
10 electromagnetic interference (EMI).

1 106. (New) The fiber optic module of claim 105 wherein:

2 the metallic shielded housing is electrically coupled to
3 ground.

1 107. (New) The fiber optic module of claim 106 wherein:

2 the metallic shielded housing electrically couples to
3 ground by coupling to a system chassis.

1 108. (New) The fiber optic module of claim 106 wherein:

2 the metallic shielded housing electrically couples to
3 ground through a trace on the first printed circuit board which
4 is coupled to one of the one or more pins of the first printed
5 circuit board.

1 109. (New) The fiber optic module of claim 105 wherein,

2 the metallic shielded housing has a base as a portion
3 thereof, the base having one or more openings from which the one
4 or more pins of the first printed board extend.

1 110. (New) The fiber optic module of claim 105 further
2 comprising:

3 a base coupled to the metallic shielded housing, the base
4 having one or more openings from which the one or more pins of
5 the first printed board may extend.

1 111. (New) The fiber optic module of claim 105 further
2 comprising:

3 a second optoelectronic device to receive photons out of or
4 couple photons into a second optical fiber;

5 a second printed circuit board parallel to the first
6 printed circuit board, the second printed circuit board coupled
7 to the second optoelectronic device parallel to an optical axis
8 of the second optoelectronic device, the second printed circuit
9 board having a second plurality of pins; and wherein,

10 the metallic shielded housing is spaced apart around the
11 first and second printed circuit boards to reduce
12 electromagnetic interference (EMI).

1 112. (New) The fiber optic module of claim 111 wherein,

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11

2 the first optoelectronic device is a photodetector to
3 receive photons out of the first optical fiber,
4 the second optoelectronic device is an emitter to couple
5 photons into the second optical fiber, and
6 the fiber optic module is a fiber optic transceiver module.
